NAVSEA
STANDARD ITEM

FY-02

ITEM NO: 009-12
DATE: 14 SEP 2000
CATEGORY: II

1. SCOPE:

1.1 Title: Welding, Fabrication, and Inspection Requirements; accomplish

2. REFERENCES:

a. Standard Items

b. MIL-STD-1689, Fabrication, Welding, and Inspection of Ships Structure

c. American Bureau of Shipping (ABS) Rules for Building and Classing Steel Vessels

d. 0900-LP-060-4010, Fabrication, Welding, and Inspection of Metal Boat and Craft Hulls

e. S9074-AQ-GIB-010/248, Requirements for Welding and Brazing Procedure and Performance Qualification

f. 0900-LP-001-7000, Fabrication and Inspection of Brazed Piping Systems

g. S9074-AR-GIB-010/278, Requirements for Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping, and Pressure Vessels

h. MIL-STD-22, Welded Joint Design

i. MIL-STD-2035, Nondestructive Testing Acceptance Criteria

j. T9074-AS-GIB-010/271, Requirements for Nondestructive Testing Methods

k. DOD-STD-2185, Requirements for Repair and Straightening of Bronze Naval Ship Propellers

l. S9221-C1-GTP-010/020, Repair and Overhaul, Main Propulsion Boilers

m. MIL-STD-2191, Repair, Welding, Weld Cladding, Straightening, and Cold Rolling of Main Propulsion Shafting

3. REQUIREMENTS:

3.1 Utilize specific requirements of 2.b through 2.l listed in Tables One, 2, 3, and 4 of this item for determining the welder and brazer qualifications, electrodes, weld design, welding requirements, brazing requirements, welding procedures, brazing procedures, welding parameters and controls, inspection standards, and acceptance criteria.

3.2 Ground welding machines, for purposes of providing a return path for welding current, using a grounding bar or lead which shall be connected directly from the machine ground return connection to the ship's hull, sized on the basis of 1,000,000 Circular Mils per 1,000 amps per 100 feet, but in no event using less than a Number One cable (85,037 Circular Mils).

3.2.1 Welding machines used for welding on machinery, pressure vessels, or piping, rotating ordnance, electronic, or fire control equipment shall have the ground return connection in the immediate vicinity of the work to ensure that current does not flow through bearings, pipe hangers, or other areas where arcing or high resistance paths exist. For ships constructed of non-magnetic materials, the ground return cables shall be connected directly to the component being welded - as close to the weld zone as feasible.

3.3 Accomplish the requirements of 009-09 of 2.a for specific welding, brazing, and inspection operations as follows:

3.3.1 Class A-F, A-1, A-2, A-3, A-LT, P-1, P-LT, M-1, and T-1 welding, as defined by 2.g. These procedures shall include, as a minimum, the information required by Paragraph 4.1.3 of 2.g. Joint numbers shall not be duplicated on ship during the availability.

3.3.2 Class P-3A silver brazing, as defined by 2.f. The procedure shall include, as a minimum, the information required by Sections 4, 5, and 6 of 2.f.

3.3.3 For propellers other than bronze, using 2.g for guidance.

3.3.4 For propulsion shafting and rudder stocks, using 2.m for guidance.

3.4 Do not deposit ferritic welds on welds made with austenitic or non-ferrous electrodes. Where the base material is ferrous and the existing weld is austenitic or non-ferrous, that weld shall be completely removed prior to welding with ferritic electrodes. The welding shall be accomplished in accordance with 2.b.

3.5 Utilize Attachment A to define combatant and non-combatant vessels and applicable table.

3.6 Where requirements in the repair and testing instructions for propulsion boilers conflict, 2.l shall take precedence.

4. NOTES:

4.1 When this note is referenced and the fabrication document requires record retention, the inspection is to be annotated with an (I).

4.2 The paragraph referencing this note is considered an (I) if the welding/brazing is Class P-1, P-LT, P-3A, M-1 or T-1. If the welding/brazing is Class P-2, P-3B, M-2, or T-2, then the paragraph is considered a (V).

4.3 Brazing of Class P-3b steam piping is considered (V)(G).

TABLE 1
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

LINE	COLUMN SITUATION EVOLUTION	A CLASS P-1, P-2 AND P-LT PIPING	B CLASS P-3A AND P-3B PIPING	C HARD FACING VALVE PARTS	D CLASS A PRESSURE VESSEL	D ** PROPULSION BOILERS	E *PROPELLERS (BRONZE)
1	WELDER AND BRAZER QUALIFICATION	S9074-AQ-GIB-010/248 PARAGRAPH 5	0900-LP-001-7000 SECTION 4	S9074-AQ-GIB-010/248, PARAGRAPH 5		S9221-C1-GTP-010/020	
2	WELDING PROCEDURE	S9074-AQ-GIB-010/248 PARAGRAPH 4	NOT APPLICABLE	S9074-AQ-GIB-010/248, PARAGRAPH 4		S9221-C1-GTP-010/020	DOD-STD-2185 PARAGRAPH 4
3	BRAZING PROCEDURE	NOT APPLICABLE	0900-LP-001-7000 SECTION 4	NOT APPLICABLE			
4	WELDING REQUIREMENTS	S9074-AR-GIB-010/278 PARAGRAPH 6	0900-LP-001-7000 SECTION 5	S9074-AR-GIB-010/278 PARAGRAPH 6			MIL-STD-2185 PARAGRAPH 5
5	FILLER MATERIAL	S9074-AR-GIB-010/278 PARAGRAPH 5	0900-LP-001-7000 SECTION 5	S9074-AR-GIB-010/278, PARAGRAPH 5		S9221-C1-GTP-010/020	DOD-STD-2185 PARAGRAPH 5
6	JOINT DESIGN	S9074-AR-GIB-010/278 PARAGRAPH 9 MIL-STD-22	0900-LP-001-7000 SECTION 5	NOT APPLICABLE	S9074-AR-GIB-010/278 PARAGRAPH 9 MIL-STD-22	S9221-C1-GTP-010/020	

* - PARAGRAPH 3.3.3 APPLIES
** - PARAGRAPH 3.6 APPLIES

TABLE 1
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

	COLUMN	A	B	C	D		E
LINE	SITUATION EVOLUTION	CLASS P-1, P-2 AND P-LT PIPING	CLASS P-3A AND P-3B PIPING	HARD FACING VALVE PARTS	CLASS A PRESSURE VESSEL	** PROPULSION BOILERS	*PROPELLERS (BRONZE)
7	HEAT TREATMENT	S9074-AR-GIB-010/278 PARAGRAPH 6	0900-LP-001-7000 SECTION 5	S9074-AR-GIB-010/278 PARAGRAPHS 6 AND 11.6	S9074-AR-GIB-010/278 PARAGRAPH 6	S9221-C1-GTP-010/020	S9074-AR-GIB-010/278 PARAGRAPH 6 DOD-STD-2185 PARAGRAPH 5
8	WORKMANSHIP REQUIREMENTS	S9074-AR-GIB-010/278 PARAGRAPH 7	0900-LP-001-7000 SECTION 5	S9074-AR-GIB-010/278 PARAGRAPHS 7 AND 11.6	S9074-AR-GIB-010/278 PARAGRAPH 7	S9221-C1-GTP-010/020	S9074-AR-GIB-010/278 PARAGRAPH 7
9	VISUAL INSPECT JOINT FIT-UP	S9074-AR-GIB-010/278 PARAGRAPH 9 MIL-STD-22 (V) ***OR (V)(G) (SEE 4.3)*** "JOINT FIT-UP"	0900-LP-001-7000 SECTION 7 (V) "JOINT FIT-UP"	NOT APPLICABLE	S9074-AR-GIB-010/278 PARAGRAPH 9 MIL-STD-22 (V) "JOINT FIT-UP"	S9221-C1-GTP-010/020	DOD-STD-2185 PARAGRAPH 5
10	VISUAL INSPECTION	S9074-AR-GIB-010/278 PARAGRAPH 10 MIL-STD-2035 SECTION 4 (V) OR (I) "VISUAL INSPECTION" (SEE 4.2)	0900-LP-001-7000 SECTION 7 AND 8 (V) OR (I) "VISUAL INSPECTION" (SEE 4.2)	S9074-AR-GIB-010/278 PARAGRAPH 11.6.3 MIL-STD-2035 SECTION 4	S9074-AR-GIB-010/278 PARAGRAPH 10 MIL-STD-2035 SECTION 4 (I) "VISUAL INSPECTION"		MIL-STD-2035 SECTION 4

* - PARAGRAPH 3.3.3 APPLIES
** - PARAGRAPH 3.6 APPLIES

TABLE 1
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

	COLUMN	A	B	C	D		E
LINE	SITUATION EVOLUTION	CLASS P-1, P-2 AND P-LT PIPING	CLASS P-3A AND P-3B PIPING	HARD FACING VALVE PARTS	CLASS A PRESSURE VESSEL	** PROPULSION BOILERS	*PROPELLERS (BRONZE)
11	RADIOGRAPHIC INSPECTION (RT)	S9074-AR-GIB-010/278 PARAGRAPH 10 T9074-AS-GIB-010/271 PARAGRAPH 3 MIL-STD-2035 SECTION 5 (NORMALLY ONLY P-1 AND P-LT) (I) "RT"	NOT APPLICABLE		S9074-AR-GIB-010/278 PARAGRAPH 10 T9074-AS-GIB-010/271 PARAGRAPH 3 MIL-STD-2035 SECTION 5 (I) "RT"		NOT APPLICABLE
12	ULTRASONIC INSPECTION (UT)	NOT APPLICABLE	0900-LP-001-7000 SECTIONS 6,7,8 AND 9 FOR CLASS P-3A PIPING ONLY (I) "UT"	NOT APPLICABLE			***S9245-AR-TSM-010/PROP PARAGRAPH 5-7.5.2***
13	LIQUID PENETRANT INSPECTION (PT)	S9074-AR-GIB-010/278 PARAGRAPH 10 T9074-AS-GIB-010/271 PARAGRAPH 5 MIL-STD-2035 SECTION 7 (NORMALLY ONLY P-1 AND P-LT) (I) "PT"	0900-LP-001-7000 SECTION 7 AND 8 (V) OR (I) "PT" (SEE 4.2)	S9074-AR-GIB-010/278 PARAGRAPH 11.6.3 MIL-STD-2035 SECTION 7 (I) "PT"	S9074-AR-GIB-010/278 PARAGRAPH 10 T9074-AS-GIB-010/271 PARAGRAPH 5 MIL-STD-2035 SECTION 7 (I) "PT"		MIL-STD-2035 SECTION 7 T9074-AS-GIB-010/271 PARAGRAPH 5 (I) "PT"
14	MAGNETIC PARTICLE INSPECTION (MT)	S9074-AR-GIB-010/278 PARAGRAPH 10 T9074-AS-GIB-010/271 PARAGRAPH 4 MIL-STD-2035 SECTION 6 (NORMALLY ONLY P-1 AND P-LT) (I) "MT"	NOT APPLICABLE		S9074-AR-GIB-010/278 PARAGRAPH 10 T9074-AS-GIB-010/271 PARAGRAPH 4 MIL-STD-2035 SECTION 6 (I) "MT"		NOT APPLICABLE

* - PARAGRAPH 3.3.3 APPLIES
** - PARAGRAPH 3.6 APPLIES

TABLE 1
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

	COLUMN	F	G	H	I	J
LINE	SITUATION EVOLUTION	MACHINERY CLASS M	TURBINE PARTS	CASTINGS	FORCED DRAFT BLOWERS	REDUCTION AND STEAM TURBINE DRIVEN AUXILIARY GEARS
1	WELDER AND BRAZER QUALIFICATIONS	S9074-AQ-GIB-010/248, PARAGRAPH 5				
2	WELDING PROCEDURE	S9074-AQ-GIB-010/248, PARAGRAPH 4				
3	BRAZING PROCEDURE	NOT APPLICABLE				
4	WELDING REQUIREMENTS	S9074-AR-GIB-010/278 PARAGRAPH 6				
5	FILLER MATERIAL	S9074-AR-GIB-010/278, PARAGRAPH 5				
6	JOINT DESIGN	S9074-AR-GIB-010/278, PARAGRAPH 9, AND MIL-STD-22				
7	HEAT TREATMENT	S9074-AR-GIB-010/278, PARAGRAPHS 6 AND 8				
8	WORKMANSHIP REQUIREMENTS	S9074-AR-GIB-010/278, PARAGRAPH 7				
9	VISUAL INSPECT JOINT FIT-UP	S9074-AR-GIB-010/278, PARAGRAPH 10, AND MIL-STD-22 (V) "JOINT FIT-UP"				
10	VISUAL INSPECTION	S9074-AR-GIB-010/278 PARAGRAPH 10 MIL-STD-2035 SECTION 4 (V) or (I) "VISUAL INSPECTION" (See 4.2)	S9074-AR-GIB-010/278 PARAGRAPH 14 (V) or(I) "VISUAL INSPECTION" (See 4.2)	S9074-AR-GIB-010/278 PARAGRAPH 13 MIL-STD-2035 SECTION 4	S9074-AR-GIB-010/278 PARAGRAPH 16	S9074-AR-GIB-010/278 PARAGRAPH 15
11	RADIOGRAPHIC INSPECTION (RT)	S9074-AR-GIB-010/278 PARAGRAPH 10 T9074-AS-GIB-010/271 PARAGRAPH 3 MIL-STD-2035 SECTION 5 (I) "RT"	S9074-AR-GIB-010/278 PARAGRAPH 14 T9074-AS-GIB-010/271 PARAGRAPH 3 MIL-STD-2035 SECTION 5 (I) "RT"	S9074-AR-GIB-010/278 PARAGRAPH 13	S9074-AR-GIB-010/278 PARAGRAPH 16 T9074-AS-GIB-010/271 PARAGRAPH 3 MIL-STD-2035 SECTION 5	NOT APPLICABLE

TABLE 1
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

	COLUMN	F	G	H	I	J
LINE	SITUATION EVOLUTION	MACHINERY CLASS M	TURBINE PARTS	CASTINGS	FORCED DRAFT BLOWERS	REDUCTION AND STEAM TURBINE DRIVEN AUXILIARY GEARS
12	ULTRASONIC INSPECTION (UT)	S9074-AR-GIB-010/278 PARAGRAPH 10 T9074-AS-GIB-010/271 PARAGRAPH 6 MIL-STD-2035 SECTION 8 (I) "UT"	S9074-AR-GIB-010/278 PARAGRAPH 14 (I) "UT"	S9074-AR-GIB-010/278 PARAGRAPH 13	S9074-AR-GIB-010/278 PARAGRAPH 16	S9074-AR-GIB-010/278 PARAGRAPH 15
13	LIQUID PENETRANT INSPECTION (PT)	S9074-AR-GIB-010/278 PARAGRAPH 10 T9074-AS-GIB-010/271 PARAGRAPH 5 MIL-STD-2035 SECTION 7 (V) or (I) "PT" (See 4.2)	S9074-AR-GIB-010/278 PARAGRAPH 14 T9074-AS-GIB-010/271 PARAGRAPH 5 MIL-STD-2035 SECTION 7 (V) or (I) "PT" (See 4.2)	S9074-AR-GIB-010/278 PARAGRAPH 13 T9074-AS-GIB-010/271 PARAGRAPH 5 MIL-STD-2035 SECTION 7	S9074-AR-GIB-010/278 PARAGRAPH 16 T9074-AS-GIB-010/271 PARAGRAPH 5 MIL-STD-2035 SECTION 7	S9074-AR-GIB-010/278 PARAGRAPH 15 T9074-AS-GIB-010/271 PARAGRAPH 5 MIL-STD-2035 SECTION 7
14	MAGNETIC PARTICLE INSPECTION (MT)	S9074-AR-GIB-010/278 PARAGRAPH 10 T9074-AS-GIB-010/271 PARAGRAPH 4 MIL-STD-2035 SECTION 6 (V) or (I) "MT" (See 4.2)	S9074-AR-GIB-010/278 PARAGRAPH 14 T9074-AS-GIB-010/271 PARAGRAPH 4 MIL-STD-2035 SECTION 6 (V) or (I) "MT" (See 4.2)	S9074-AR-GIB-010/278 PARAGRAPH 13 T9074-AS-GIB-010/271 PARAGRAPH 4 MIL-STD-2035 SECTION 6	S9074-AR-GIB-010/278 PARAGRAPH 16 T9074-AS-GIB-010/271 PARAGRAPH 4 MIL-STD-2035 SECTION 6	S9074-AR-GIB-010/278 PARAGRAPH 15 T9074-AS-GIB-010/271 PARAGRAPH 4 MIL-STD-2035 SECTION 6

TABLE 2
WELDING, FABRICATION, AND INSPECTION OF SURFACE SHIP HULLS (COMBATANT)

LINE	COLUMN	A	B	C	D	E	F
	MATERIAL EVOLUTION	CARBON STEEL (MS) AND (HTS)	*HIGH STRENGTH STEEL (HY-80/100, HSLA-80 AND STS)	ALUMINUM ALLOY	CHROMIUM NICKEL STEEL (STAINLESS)	COPPER AND/OR NICKEL BASE ALLOYS	SILICONE BRONZE ALUMINUM BRONZE
1	WELDER QUALIFICATION	S9074-AQ-GIB-010/248, PARAGRAPH 5					
2	WELDING PROCEDURE	S9074-AQ-GIB-010/248, PARAGRAPH 4					
3	ELECTRODE	MIL-STD-1689 PARAGRAPH 10 TABLE X	MIL-STD-1689 PARAGRAPH 10 TABLE XI	MIL-STD-1689 PARAGRAPH 10 TABLE XVI	MI-STD-1689 PARAGRAPH 10 TABLES XII AND XIII	MIL-STD-1689 PARAGRAPH 10 TABLES XIV AND XV	S9074-AR-GIB-010/278 TABLE II
4	JOINT DESIGN	MIL-STD-22 MIL-STD-1689, PARAGRAPH 11					
5	WELDING REQUIREMENTS	MIL-STD-1689, PARAGRAPH 13					
6	WORKMAN-SHIP REQUIREMENTS	MIL-STD-1689, PARAGRAPHS 12 AND 14					
7	VISUAL (I) If applicable; see 4.1.	MIL-STD-1689, PARAGRAPHS 6, 7, AND 8 T9074-AS-GIB-010/271, PARAGRAPH 8					
8	RADIO-GRAPHIC INSPECTION (RT) (I) If applicable; see 4.1.	MIL-STD-1689, PARAGRAPHS 6, 7, AND 8 MIL-STD-2035, SECTION 5 T9074-AS-GIB-010/271, PARAGRAPH 3					

* - PARAGRAPH 3.4 APPLIES

TABLE 2
WELDING, FABRICATION, AND INSPECTION OF SURFACE SHIP HULLS (COMBATANT)

LINE	COLUMN	A	B	C	D	E	F
	MATERIAL EVOLUTION	CARBON STEEL (MS) AND (HTS)	*HIGH STRENGTH STEEL (HY-80/100, HSLA-80 AND STS)	ALUMINUM ALLOY	CHROMIUM NICKEL STEEL (STAINLESS)	COPPER AND/OR NICKEL BASE ALLOYS	SILICONE BRONZE ALUMINUM BRONZE
9	ULTRASONIC INSPECTION (UT) (I) If applicable; see 4.1.	MIL-STD-2035, SECTION 8 MIL-STD-1689, PARAGRAPHS 6, 7, AND 8 T9074-AS-GIB-010/271, PARAGRAPH 6					
10	LIQUID PENETRANT INSPECTION (PT) (I) If applicable; see 4.1.	T9074-AS-GIB-010/271 PARAGRAPH 5	MIL-STD-1689, PARAGRAPHS 6, 7, AND 8 T9074-AS-GIB-010/271, PARAGRAPH 5				
11	MAGNETIC PARTICLE INSPECTION (MT) (I) If applicable; see 4.1.	MIL-STD-1689, PARAGRAPH 6 T9074-AS-GIB-010/271, PARAGRAPH 4		NOT APPLICABLE			

* - PARAGRAPH 3.4 APPLIES

TABLE 3
WELDING, FABRICATION, AND INSPECTION OF SURFACE SHIP HULLS (NON-COMBATANT) * **

LINE	COLUMN	A	B	C	D	E	F
	MATERIAL EVOLUTION	CARBON STEEL (MS)	*** HIGH STRENGTH STEEL (HY-80/100)	ALUMINUM ALLOY	CHROMIUM NICKEL STEEL (STAINLESS)	COPPER AND/OR NICKEL BASE ALLOYS	SILICONE BRONZE ALUMINUM BRONZE
1	WELDER QUALIFICATION	ABS RULES, PART 2, SECTION 3, PART A					
2	WELDING PROCEDURE	ABS RULES, PART 2, SECTION 3, PART A					
3	ELECTRODE	ABS RULES, PART 2, SECTION 3, PART A					
4	JOINT DESIGN	ABS RULES, PART 2, SECTION 3, PART A					
5	WELDING REQUIREMENTS	ABS RULES, PART 2, SECTION 3, PART A					
6	WORKMANSHIP REQUIREMENTS	ABS RULES, PART 2, SECTION 3, PART A					
7	VISUAL	ABS RULES, PART 2, SECTION 3, PART A					
8	RADIOGRAPHIC INSPECTION (RT)	ABS RULES, PART 2, SECTION 3, PART A					

TABLE 3
WELDING, FABRICATION, AND INSPECTION OF SURFACE SHIP HULLS (NON-COMBATANT) * **

LINE	COLUMN	A	B	C	D	E	F
	MATERIAL EVOLUTION	CARBON STEEL (MS)	*** HIGH STRENGTH STEEL (HY-80/100)	ALUMINUM ALLOY	CHROMIUM NICKEL STEEL (STAINLESS)	COPPER AND/OR NICKEL BASE ALLOYS	SILICONE BRONZE ALUMINUM BRONZE
9	ULTRASONIC INSPECTION (UT)	ABS RULES, PART 2, SECTION 3, PART A					
10	LIQUID PENETRANT INSPECTION (PT)	ABS RULES, PART 2, SECTION 3, PART A					
11	MAGNETIC PARTICLE INSPECTION (MT)	ABS RULES, PART 2, SECTION 3, PART A		NOT APPLICABLE			

* - IDENTIFICATION OF "SURVEYOR" IN ABS RULES SIGNIFIES SUPERVISOR OF SHIPBUILDING (SUPERVISOR) ACTION. THE SUPERVISOR MAY USE MIL-STD-1689 FOR GUIDANCE WHERE ADDITIONAL DIRECTION IS NECESSARY. SUCH GUIDANCE MAY BE USED TO: ESTABLISH NDT REQUIREMENTS, ESTABLISH WELDING/NDT PROCEDURE AND PERSONNEL QUALIFICATION REQUIREMENTS, OR TO DEFINE OTHER ATTRIBUTES LISTED IN THE "MATERIAL EVOLUTION" LINE OF TABLE 3.

** - THE SUPERVISOR MAY ALSO ALLOW THE SHIPBUILDER TO CHOOSE FROM THE FOLLOWING OPTIONS, PROVIDING:

- THE SHIPBUILDER'S UTILIZATION OF THE FOLLOWING OPTIONS SHALL RESULT IN NO ADDITIONAL COST TO THE GOVERNMENT.
- THE SHIPBUILDER SHALL UTILIZE THE FABRICATION DOCUMENT SELECTED FOR THE ENTIRE AVAILABILITY AND SHALL NOT SWITCH BACK AND FORTH BETWEEN DOCUMENTS.
- THE SHIPBUILDER SHALL NOTIFY THE SUPERVISOR OF WHICH FABRICATION DOCUMENT HAS BEEN SELECTED.

OPTIONS:

A) MIL-STD-1689 MAY BE UTILIZED BY THE SHIPBUILDER AT THE SHIPBUILDER'S DISCRETION. THE REQUIREMENTS OF TABLE 2 ABOVE WOULD THEN APPLY.

B) FOR DETERMINATION OF NDT METHOD(S) AND EXTENT OF NDT INSPECTION WHEN REPAIRS ARE TO BE ACCOMPLISHED, THE SHIPBUILDER MAY REQUEST TO UTILIZE THE SAME NDT REQUIREMENTS WHICH WERE INVOKED IN CONSTRUCTION OF THE VESSEL. IN SUCH CASES, THE SHIPBUILDER SHALL BE RESPONSIBLE TO DETERMINE THE ORIGINAL NDT REQUIREMENTS AND SUBMIT EVIDENCE SUCH AS DRAWINGS OR SPECIFICATIONS WHICH DETAIL THE REQUIREMENTS TO THE SUPERVISOR ALONG WITH A REQUEST FOR APPROVAL.

C) THE SHIPBUILDER MAY REQUEST TO UTILIZE PRE-ESTABLISHED WELDING AND/OR NDT PROCEDURES AND PERSONNEL QUALIFICATION PROGRAM(S) WHICH HAVE BEEN PREVIOUSLY UTILIZED IN THE PERFORMANCE OF SIMILAR ABS-ACCEPTED WORK. IN SUCH CASES, THE SHIPBUILDER SHALL SUBMIT EVIDENCE OF SUCH ABS ACCEPTABILITY TO THE SUPERVISOR ALONG WITH DESCRIPTIVE DETAILS AND SUPPORTING DOCUMENTATION FOR THE PROPOSED PROGRAM(S). SUCH DOCUMENTATION SHALL INCLUDE THE WELDING/NDT PROCEDURES AND METHODS OF WELDING/NDT PERSONNEL QUALIFICATION WHICH WERE UTILIZED IN FORMER ABS-ACCEPTED WORK. THE SHIPBUILDER SHALL ALSO SUBMIT OTHER SUPPORTING EVIDENCE WHICH MAY BE REQUESTED BY THE SUPERVISOR TO ESTABLISH THAT THE PROPOSED PROGRAMS HAVE BEEN PREVIOUSLY UTILIZED FOR SIMILAR ABS-ACCEPTED WORK.

*** - PARAGRAPH 3.4 APPLIES.

TABLE 4
WELDING, FABRICATION, AND INSPECTION OF METAL BOAT AND CRAFT HULLS

LINE	COLUMN	A	B	C	D	E	F
	MATERIAL EVOLUTION	CARBON STEEL (MS)	*HIGH STRENGTH STEEL (HY-80/100)	ALUMINUM ALLOY	CHROMIUM NICKEL STEEL (STAINLESS)	COPPER AND/OR NICKEL BASE ALLOYS	SILICONE BRONZE ALUMINUM BRONZE
1	WELDER QUALIFICATION	S9074-AQ-GIB-010/248, PARAGRAPH 5					
2	WELDING PROCEDURE	S9074-AQ-GIB-010/248, PARAGRAPH 4					
3	ELECTRODE	0900-060-4010 SECTION 10 TABLE 10-1	0900-060-4010 SECTION 10 TABLES 10-2 AND 10-3	0900-060-4010 SECTION 10 TABLE 10-7	0900-060-4010 SECTION 10 TABLE 10-4	0900-060-4010 SECTION 10, TABLES 10-5 AND 10-6	S9074-AR-GIB-010/278 TABLE II
4	JOINT DESIGN	MIL-STD-22 0900-060-4010, SECTION 11					
5	WELDING REQUIREMENTS	0900-060-4010, SECTION 13					
6	WORKMANSHIP REQUIREMENTS	0900-060-4010, SECTION 14					
7	VISUAL	0900-060-4010, SECTIONS 6, 7, AND 8 T9074-AS-GIB-010/271, PARAGRAPH 8					
8	RADIOGRAPHIC INSPECTION (RT)	0900-060-4010, SECTION 6, TABLE 6-1 AND SECTIONS 7 AND 8 T9074-AS-GIB-010/271, PARAGRAPH 3					
9	ULTRASONIC INSPECTION (UT)	T9074-AS-GIB-010/271, PARAGRAPH 6					
10	LIQUID PENETRANT INSPECTION (PT)	0900-060-4010, SECTIONS 6, 7, AND 8 T9074-AS-GIB-010/271, PARAGRAPH 5					
11	MAGNETIC PARTICLE INSPECTION (MT)	0900-060-4010 SECTION 6 T9074-AS-GIB-010/271, PARAGRAPH 4		NOT APPLICABLE			

* - PARAGRAPH 3.4 APPLIES

ATTACHMENT A
COMBATANT SURFACE SHIPS

WARSHIPS		TABLE
Aircraft Carriers:		
Aircraft Carrier	CV	2
Aircraft Carrier (nuclear propulsion)	CVN	2
ASW Aircraft Carrier	CVS	2
Surface Combatants:		
Battleship	BB	2
Guided Missile Cruiser	CG	2
Guided Missile Cruiser (nuclear powered)	CGN	2
Destroyer	DD	2
Guided Missile Destroyer	DDG	2
Frigate	FF	2
Guided Missile Frigate	FFG	2
Frigate (Naval Reserve Training)	FFT	2
Patrol Combatants:		
Patrol Combatant Missile (hydrofoil)	PHM	2
Patrol Coastal	PC	2

AMPHIBIOUS WARFARE SHIPS		
Amphibious Command Ship	LCC	2
Amphibious Assault Ship (general purpose)	LHA	2
Amphibious Cargo Ship	LKA	2
Amphibious Transport Dock	LPD	2
Amphibious Assault Ship (helicopter)	LPH	2
Dock Landing Ship	LSD	2
Amphibious Assault Ship (general purpose)	LHD	2
Tank Landing Ship	LST	2

AUXILIARY SHIPS		
Ammunition Ship	AE	2
Combat Store Ship	AFS	2
Oiler	AO	2
Fast Combat Support Ship	AOE	2
Replenishment Oiler	AOR	2
Store Ship	AF	2

ATTACHMENT A
(Con't)

MINE WARFARE SHIPS TABLE

Mine Countermeasures Support Ship	MCS	2
Mine Countermeasures Ship	MCM	2
Coastal Minehunter	MHC	2

COMBATANT SURFACE CRAFT

AMPHIBIOUS WARFARE CRAFT

Landing Craft, Air Cushion	LCAC	4
Landing Craft, Mechanized	LCM	4
Landing Craft, Personnel, Large	LCPL	4
Landing Craft, Utility	LCU	2
Landing Craft, Vehicle, Personnel	LCVP	4
Light Seal Support Craft	LSSC	4
Amphibious Warping Tug	LWT	4
Medium Seal Support Craft	MSSC	4
Swimmer Delivery Vehicle	SDV	4
Side Loading Warping Tug	SLWT	4
Special Warfare Craft, Light	SWCL	4
Special Warfare Craft, Medium	SWCM	4

PATROL CRAFT

Mini-Armored Troop Carrier	ATC	4
Patrol Boat	PB	4
River Patrol Boat	PBR	4
Patrol Craft (fast)	PCF	4
Fast Patrol Craft	PTF	4

ATTACHMENT A
(Con't)

NON-COMBATANT SURFACE SHIPS

AUXILIARY SHIPS		TABLE
Auxiliary Crane Ship	ACS	3
Destroyer Tender	AD	3
Miscellaneous	AG	3
Deep Submergence Support Ship	AGDS	3
Miscellaneous Command Ship	AGF	3
Auxiliary General Frigate	AGFF	3
Missile Range Instrumentation Ship	AGM	3
Oceanographic Research Ship	AGOR	3
Ocean Surveillance Ship	AGOS	3
Surveying Ship	AGS	3
Auxiliary Research Submarine	AGSS	3
Hospital Ship	AH	3
Cargo Ship	AK	3
Auxiliary Cargo Barge/Lighter Ship	AKB	3
Auxiliary Cargo Float-On/Float-Off Ship	AKF	3
Gasoline Tanker	AOG	3
Transport Oiler	AOT	3
Transport	AP	3
Barracks Craft	APL	3
Repair Ship	AR	3
Cable Repairing Ship	ARC	3
Salvage Ship	ARS	3
Submarine Tender	AS	3
Submarine Rescue Ship	ASR	3
Fleet Ocean Tug	ATF	3
Salvage and Rescue Ship	ATS	3
Aviation Logistic Support Ship	AVB	3

ATTACHMENT A
(Con't)

NON-COMBATANT SURFACE CRAFT

SERVICE CRAFT

Large Auxiliary Floating Dry Dock (non-self-propelled) ...AFDB... 3
Small Auxiliary Floating Dry Dock (non-self-propelled) ...AFDL... 3
Medium Auxiliary Floating Dry Dock (non-self-propelled) ..AFDM... 3
Auxiliary Repair Dry Dock (non-self-propelled) .....ARD... 3
Medium Auxiliary Repair Dry Dock (non-self-propelled) ....ARDM... 3
Causeway Section, Powered .....CSP... 3
Causeway Section (non-self-propelled) .....CSNP... 3
Unclassified Miscellaneous .....IX... 3
Miscellaneous Auxiliary (self-propelled) .....YAG... 3
Open Lighter (non-self-propelled) .....YC... 3
Car Float (non-self-propelled) .....YCF... 3
Aircraft Transportation Lighter (non-self-propelled) .....YCV... 3
Cargo Semi-Submersible Barge .....YCSS... 3
Floating Crane (non-self-propelled) .....YD... 3
Diving Tender (non-self-propelled) .....YDT... 3
Covered Lighter (self-propelled) .....YF... 3
Ferryboat or Launch (self-propelled) .....YFB... 3
Yard Floating Dry Dock (non-self-propelled) .....YFD... 3
Covered Lighter (non-self-propelled) .....YFN... 3
Large Covered Lighter (non-self-propelled) .....YFNB... 3
Dry Dock Companion Craft (non-self-propelled) .....YFND... 3
Lighter (special purpose) (non-self-propelled) .....YFNX... 3
Floating Power Barge (non-self-propelled) .....YFP... 3
Refrigerated Covered Lighter (self-propelled) .....YFR... 3
Refrigerated Covered Lighter (non-self-propelled) .....YFRN... 3
Covered Lighter (range tender) (self-propelled) .....YFRT... 3
Harbor Utility Craft (self-propelled) .....YFU... 3
Garbage Lighter (self-propelled) .....YG... 3
Garbage Lighter (non-self-propelled) .....YGN... 3
Salvage Lift Craft, Heavy (non-self-propelled) .....YHLC... 3
Salvage Lift Craft, Light .....YLC... 3
Dredge (self-propelled) .....YM... 3
Gate Craft (non-self-propelled) .....YNG... 3
Fuel Oil Barge (self-propelled) .....YO... 3
Gasoline Barge (self-propelled) .....YOG... 3
Gasoline Barge (non-self-propelled) .....YOGN... 3
Fuel Oil Barge (non-self-propelled) .....YON... 3
Oil Storage Barge (non-self-propelled) .....YOS... 3
Patrol Craft (self-propelled) .....YP... 4
Floating Pile Driver (non-self-propelled) .....YPD... 3

SERVICE CRAFT

Floating Workshop (non-self-propelled)	YR	3
Repair and Berthing Barge (non-self-propelled)	YRB	3
Repair, Berthing and Messing Barge (non-self-propelled)	YRBM	3
Floating Dry Dock Workshop (hull) (non-self-propelled)	YRDH	3
Floating Dry Dock Workshop (machine) (non-self-propelled)	YRDM	3
Radiological Repair Barge (non-self-propelled)	YRR	3
Salvage Craft Tender (non-self-propelled)	YRST	3
Seaplane Wrecking Derrick (self-propelled)	YSD	3
Sludge Removal Barge (non-self-propelled)	YSR	3
Large Harbor Tug	YTB	3
Small Harbor Tug	YTL	4
Medium Harbor Tug	YTM	4
Torpedo Trials Craft	YTT	4
Water Barge (self-propelled)	YW	3
Water Barge (non-self-propelled)	YWN	3

NOTES:

Letter prefixes to classification symbols may add identification:

E -- Prototype ship or craft that is in an experimental or developmental status.

T -- Assigned to MSC (Military Sealift Command)

F -- Being Constructed for a foreign government.

X -- Often added to existing classifications to indicate a new class whose characteristics has not been defined.